NUTRIENTS BEHAVIOUR IN LEAVES OF BEARING AND NON-BEARING NAGPUR MANDARIN TREES

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INTRODUCTION:

Optimum nutritional status in respect of all other essential nutrient elements is required in the citrus plant for maximum of fruits. Aiyappa et.al. (1) Suggested that nutritional requirements of crops could be determined by soil and plant analysis with varying degree of success. Several workers have reported the leaf analysis method being a practical, sensitive and convenient tool to understand the nutritional and fertilizer requirements of fruit trees. Based on leaf analysis method gives an guidelines regarding the minimum and normal nutritional levels of various nutrient elements in plant leaves which govern on overall condition of crops and its growth.

Kanwar *et. al.* (3) has reported the importance of citrus leaf analysis. However, not much work seems to have been done in nutritional status of Nagpur mandarin. Hence, Studies on nutrient elements composition in citrus leaves of fruit bearing and non-fruit bearing trees of Nagpur mandarin were undertaken at the Regional Fruit Research Station, Katol, Distt. Nagpur, Maharashtra State.

MATERIALS AND METHODS:

The healthy citrus orchards were selected for sampling from different five villages in Katol Tahsil. Approximately 5-6 months old matured fourth leaf from top of twig was collected from randomly selected fruit bearing and non-fruit bearing citrus pants during Nov. 2005. Hundred leaves from each plant were collected from its four sides. Collected leaf samples were brought in the laboratory at Regional Fruit Research Station, Katol for analysis. All the leaf samples were thoroughly washed with tap water and detergent followed

by washing with distilled water. The washed leaves were placed on blotting paper to absorb the moisture and then kept in oven at about stored in 50° C temperature and stored in paper bag. The dried leaves of each sample were grinded individually with the use of mixer-cum grinder and subjected to the analysis to determine the nutrient elements on Atomic-Absorption Spectrophotometer.

RESULTS AND DISCUSSION:

Assessment of micronutrient levels presented in Table 1 revealed that in fruit bearing citrus plants of different villages, micronutrient Cu was observed from 11.7 to 15.6 ppm which is optimum where as in non fruit bearing plants the leaves were 17.3 to 25.9 ppm which is categorized as high as per the Internationally accepted Leaf Nutrient Standards (LNS) reported by Embleton *et. al.* (2) (Table 2). Zn content of fruit bearing citrus plants was low i.e. between 18.1 to 23.5 ppm as per LNS and it is optimum in non fruit bearing plant i.e. within Range of 23.5 to 29.1 ppm. Fe and Mn were found optimum in both fruit bearing and non-fruit bearing plant within a range of 107.6 to 120.0 ppm and 45.4 to 55.2 ppm respectively, as compared with the internationally accepted leaf nutrient standards. The carbohydrate was found more in fruit bearing plant as compared with the non fruit bearing plants. This study indicated that carbohydrates played a dominant regulatory role in citrus flowering. Low level of carbohydrates did not induce bud and hence non fruit bearing plants showed lower level than the fruit bearing plants. Srivastava and Singh (4) have suggested the supplementation of carbohydrates in form of starch in 'off year of alternate bearing -which confirms the finding.

Table 1: Mean value of leaf analysis in respect of micro elements/ carbohydrates in Nagpur mandarin. (ppm on oven dry basis)

Sample of leaves collected from	Micronutrients in fruit bearing trees					Micronutrients in fruit non-bearing trees				
	Cu	ZN	Fe	Mn	Carbohy derate g/100g	Cu	ZN	Fe	Mn	Carbohyderate g/100g
Katol	15.6	18.1	109.2	45.4	14.61	25.9	29.1	111.6	45.6	11.02
Sawali	13.7	20.7	111.0	55.0	14.28	17.4	28.7	107.6	53.0	11.53
Pardi	11.7	21.4	108.7	54.4	14.65	20.5	26.3	111.9	55.2	12.30
Wandali	12.3	23.1	111.0	50.0	13.82	17.3	23.5	115.3	52.6	11.84
Dhartwada	13.3	23.5	115.9	47.9	13.53	24.4	27.4	120.0	49.5	11.79
Mean	13.3	21.4	110.5	50.5	14.18	21.1	27.0	113.8	51.2	11.70

Table 2: International Leaf Nutrient Standards for citrus :

Element	Indices (ppm)				
	Deficient	Low	Optimum	High	Excess
Cu	<3	3-4	5-16	17-20	>20
Zn	<17	18-24	25-100	101-300	>300
Fe	<35	53-59	60-120	121-200	>200
Mn	<17	18-24	25-100	101-300	>300

Summary:

Citrus growers of this region facing the problem of alternate bearing or non bearing of fruits. Hence it is thought imperative to study microelement levels of citrus leaves of fruit bearing and non fruit bearing plants by collecting and analyzing leaf samples from various five villages during Nov. 2005 in Katol Tahsil Dist. Nagpur, in fruit bearing plant the micronutrient like Cu, Fe, and Mn were found optimum carbohydrates were more and Zn was low in non fruit bearing plants Cu was high and Fe, Mn and Zn was optimum where as carbohydrates was found less which might be responsible for fruiting of citrus plants.

References:

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